DOCUMENT RESUME

ED 376 915 JC 950 024

TITLE	Predictive Validity Study of the APS Writing and Reading Tests [and] Validating Placement Rules for the APS Writing Test.
INSTITUTION	College of the Canyons, Valencia, CA. Office of Institutional Development.
PUB DATE	May 94
NOTE	29p.; For related documents, see ED 374 853 and ED 374 857.
PUB TYPE	Reports - Research/Technical (143)
EDRS PRICE	MF01/PC02 Plus Postage.
DESCRIPTORS	Community Colleges; *Cutting Scores; Grades (Scholastic); Outcomes of Education; *Predictive Validity; Predictor Variables; *Reading Tests; Scores; *Student Placement; *Test Validity; Two Year Colleges; *Writing Tests
IDENTIFIERS	*Assessment and Placement Services

ABSTRACT

California's College of the Canyons has used the College Board Assessment and Placement Services (APS) test to assess students' abilities in basic and college English since spring 1993. These two reports summarize data from a May 1994 study of the predictive validity of the APS writing and reading tests and a June 1994 effort to validate the cut scores for the writing test. The first report indicates that, based on the observed relationships between test scores and subsequent academic performance for first-time students in spring and fall 1993, the median predictive validity value of the writing test across all levels of English courses was .34, a moderately good relationship and enough to justify its use for placement. This report also indicates that for the reading test, the median predictive validity value across all levels was .14, a low linear relationship which does not warrant the test's sole use for placement. The second report describes the method used for establishing placement cut scores; i.e., determining the proportion of students with given scores who received passing and failing grades scores to determine the scores' ability to predict success. The report then describes an analysis of course grades for 340 students in spring and fall 1993 placed according to their writing test scores, indicating that more than one set of possible cut scores resulted. Finally, the report indicates that recommended cut scores were set in the lower part of the optimum range and were found to be valid predictors. (KP)

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Predictive Validity Study of the APS Writing and Reading Tests [and] Validating Placement Rules for the APS Writing Tests

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College of the Canyons
Santa Clarita Community College District

PREDICTIVE VALIDITY STUDY OF THE APS WRITING AND READING TESTS

May 1994

Office of Institutional Development

PREDICTIVE VALIDITY STUDY OF COLLEGE BOARD ASSESSMENT AND PLACEMENT SERVICES FOR COMMUNITY COLLEGES WRITING AND READING TESTS

MAY 1994

This report summarizes the predictive validity studies carried out in May 1994. The College Board APS Writing Test, a 40-question objective format test, was examined to determine its ability to predict student success in both basic skills and college level English courses offered at College of the Canyons. Similar examinations were carried out for the College Board APS Reading Test, a 35-item objective format test.

The college began using the College Board APS tests in Spring 1993 and the data for these computations represent information from first-time students for two semesters (Spring 1993 and Fall 1993).

Matriculation regulations require that community colleges which adopt a standardized test for making placement recommendations must qualify its use locally. The test must be a valid predictor of future course success given the unique features of the college curriculum, its instructors, and student population. Establishing a clear

relationship between the test score and subsequent student performance in a particular course for which placement recommendations were made is predictive validity. A correlation of no less than +.35 is needed to conclude that the test instrument has sufficient predictive validity for advisement purposes.

Descriptive Statistics. The data collected for this study are summarized in Table 1. The mean score and the coefficient of skewness provide a clue about the relative degree of difficulty of the tests. Positively skewed score distributions indicate that sampled students tend to find the test difficult. Thus, the APS Writing Test was clearly more difficult for students in English 035 than was the test for students in English 101. In a similar fashion, the APS Reading Test was more difficult for students in English 034 than it was for students in English 101.

Table 1.
Descriptive Statistics for APS Reading and Writing Tests, By Course Level

Test	Course	N	Mean	Median	Standard Deviation	Skewness
Writing	Engl 011	6	12.33	10.00	5.32	0.46
	Engl 035	45	15.42	14.00	4.04	1.69
	Engl 090	250	22.70	23.00	3.54	-0.30
	Engl 101	39	29.49	30.00	4.83	-0.89
Reading	Engl 010	10	8.00	8.50	2.79	-0.83
	Engl 034	77	13.94	14.00	2.93	1.35
	Engl 080	67	18.97	19.00	3.41	-0.24
	Engl 101	39	26.18	27.00	3.63	-1.00

Predictive Validity. The primary index of the strength of the relationship between test scores (predictor) and course grades (criterion) is the predictive validity coefficient, or the correlation between predictor and criterion.

Two correlation coefficients indicating predictive validity were computed for each course -- one between the test scores and course grades with all withdrawals (Ws) converted to Fail (F), and the second between the test scores and course grades with withdrawals deleted from the analysis. The resulting correlations are shown in Table 2 on the following page. Since the distribution of scores was restricted because the placement test scores were in use, the correlation values were adjusted by using a correction for restriction or range. The correction yields a better indication of the relationship between scores and grades by adjusting the value of the correlation coefficient to what it would be if the distribution of the predictor (APS test score) was unrestricted.

Table 2.
Relationship Between APS Reading and Writing Test Scores and Grades, By Course

Test	Course	r-Score to Grade W=Failure	r-Score to Grade Ws Excluded
Writing	Engl 011	.56 (6)	.38 (5)
	Engl 035	.37 (45)	.44 (36)
	Engl 090	.30 (244)	.37 (212)
	Engl 101	.26 (38)	.16 (30)
Reading	Engl 010	.86 (10)	.96 (7)
	Engl 034	.44 (77)	.41 (62)
	Engl 080	.11 (67)	.17 (59)
	Engl 101	-.07 (38)	-.61 (30)

RESULTS AND DISCUSSION

APS Writing Test. With the exception of English 011 - Grammar and Writing, that had only a maximum of six students in the correlations, the median predictive validity value across all levels is .34, ranging from a low of .16 to a high of .44. The correlation indicates a moderate linear relationship between the placement test scores and course grades.

The predictive validity coefficient value of .34 is only slightly below the .35 level recommended and is within the range reasonably expected for placement tests. There is a broad range of factors that are not, and can not, be tapped by the test, but which are related to performance in class. Among these are an assortment of individual difference variables, motivation level, and differences in background and experiences. Because there are such a complex array of factors that interact to determine performance in classes, many of which are non-academic, it is not reasonable to expect placement tests to be very strongly related to course grades. Indeed, recent interpretations of minimal standards suggest that predictive validity coefficients of about .30 are adequate.

APS Reading Test. With the exception of English 010 - Reading and Study Skills, that had only a maximum of 10

students in the correlations, **the median predictive validity value across all levels is .14**, ranging from a low of -.61 to a high of .44. The correlation indicates a low linear relationship between the placement test scores and course grades.

The reader is reminded that these correlations apply only to the ability of the APS tests to predict the final course grade performance of first-time college students.

CONCLUSIONS

APS Writing Test. In light of the myriad of factors that impact course grades other than the specific skills measured by the test, and the unreliability of the criterion (course grades), the obtained value of the predictive validity of the APS Writing Test is adequate to justify use of the test for placing students into writing courses at College of the Canyons.

APS Reading Test. The APS Reading Test has still not been shown to be a valid predictor of final course grades for reading courses at College of the Canyons.

The college should continue to evaluate the APS Reading Test and multiple measures which may provide the most accurate advice possible when directing students into classes. Further predictive validity computations will be performed using Spring 1994 data, as it becomes available.

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College of the Canyons
Santa Clarita Community College District

VALIDATING PLACEMENT RULES FOR THE APS WRITING TEST

June 1994

Office of Institutional Development

VALIDATING PLACEMENT RULES FOR THE APS WRITING TEST

June 1994

The report entitled Predictive Validity Study of the APS Writing and Reading Tests (May 1994) showed the adequate overall relationship between test scores and course grades for the APS Writing Test, supporting the use of the test scores as predictors of student performance at College of the Canyons.

The next issue is a very practical one -- how best to use the tests for making placement recommendations. This involves identifying cut scores. At what point in the continuum of test scores do we recommend placement of students in a given course? For example, are students who receive scores of 28 to 40 on the APS Writing Test fully prepared to undertake English 101 - English Composition and Literature? Should the score range be broader or narrower? No method of identifying cut scores is flawless. With typical validities of .35, only about 12 percent of the variance in student performance is associated with the test scores. A great many factors not tapped by the tests contribute to course grades. The goal of the process is to improve prediction of success.

METHOD

The primary method used for establishing cut scores involves comparing success rates for contrasting groups over a range of scores. More specifically, the contrasting groups are defined as "successful students" or those who earned grades of A, B, C and CR, whereas persons with grades of D, F, NC or W (withdrawal) are categorized in the "unsuccessful" group. Given this distinction, it is then possible to determine the proportion of students with specific scores, and hence for score ranges, that were successful. Cut scores are then evaluated in terms of their ability to "predict" success (i.e. maximize the difference between success rates for persons scoring above a value and those scoring below it).

Subjects. The research participants were 340 students from spring and fall semesters 1993. The students were enrolled in English 011 (N=6), English 035 (N=45), English 090 (N=250), and English 101 (N=39). The students were first-time college students and had taken the APS Writing Test just prior to enrolling in the English course. Participating students were placed in English courses using existing placement procedures, including the use of placement test scores. End-of-course grades were used as the student performance criterion.

RESULTS

Placement Rules. The scatter diagrams presented in Figures 1 through 3 show the relationship between test scores and success in each target class. These provide an initial basis for establishing trial cut scores to minimize placement errors. On the scatter plots, a number represents one or more coincident data points while letters designate two-digit numbers, i.e. A=10, B=11, C=12 etc. Withdrawals were treated as unsuccessful course outcomes in this analysis of dichotomized grades.

Figure 1.
English 035 Success by APS Writing Test

College of the Canyons

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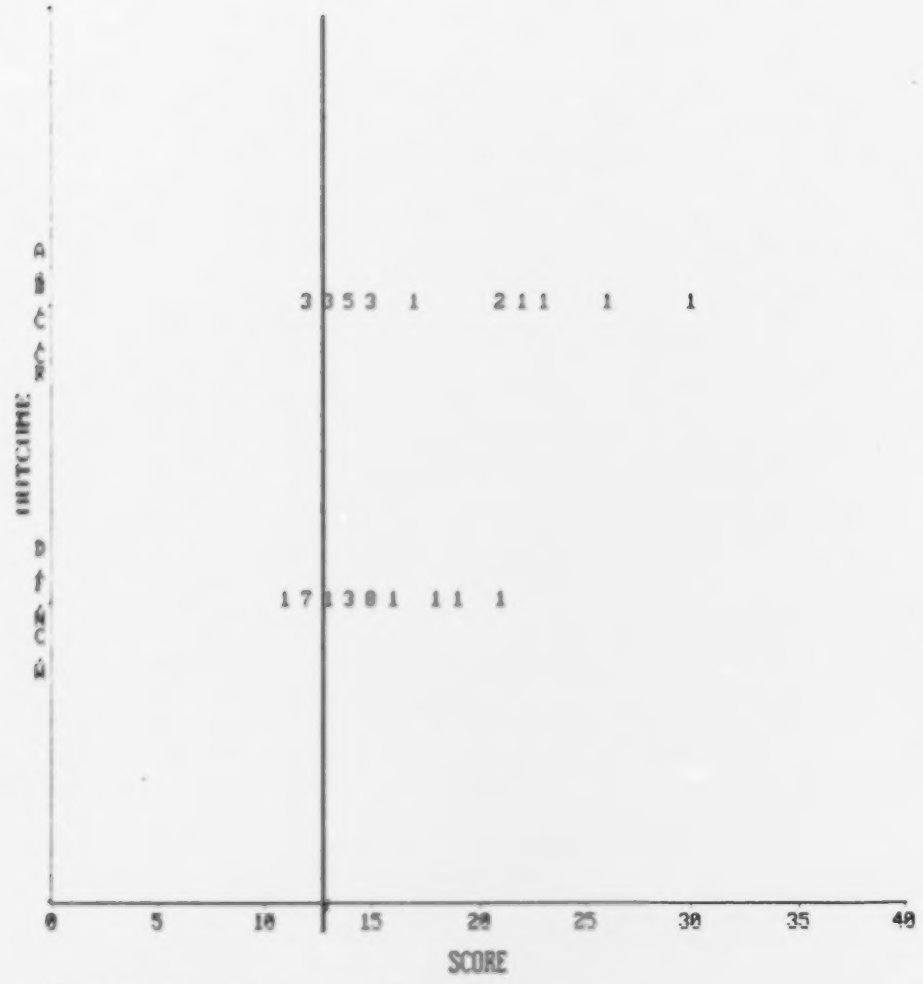
10:50:10 Page 1

SCATTER DIAGRAM
Data: English 02 - S&F93
Course: ENGL 035
Test: ENGLISH 02: APS WRITING A
Subgroup: TOTAL
N=45, R = 0.29



Trial Cut Score = 13

Figure 2.
English 090 Success by APS Writing Test

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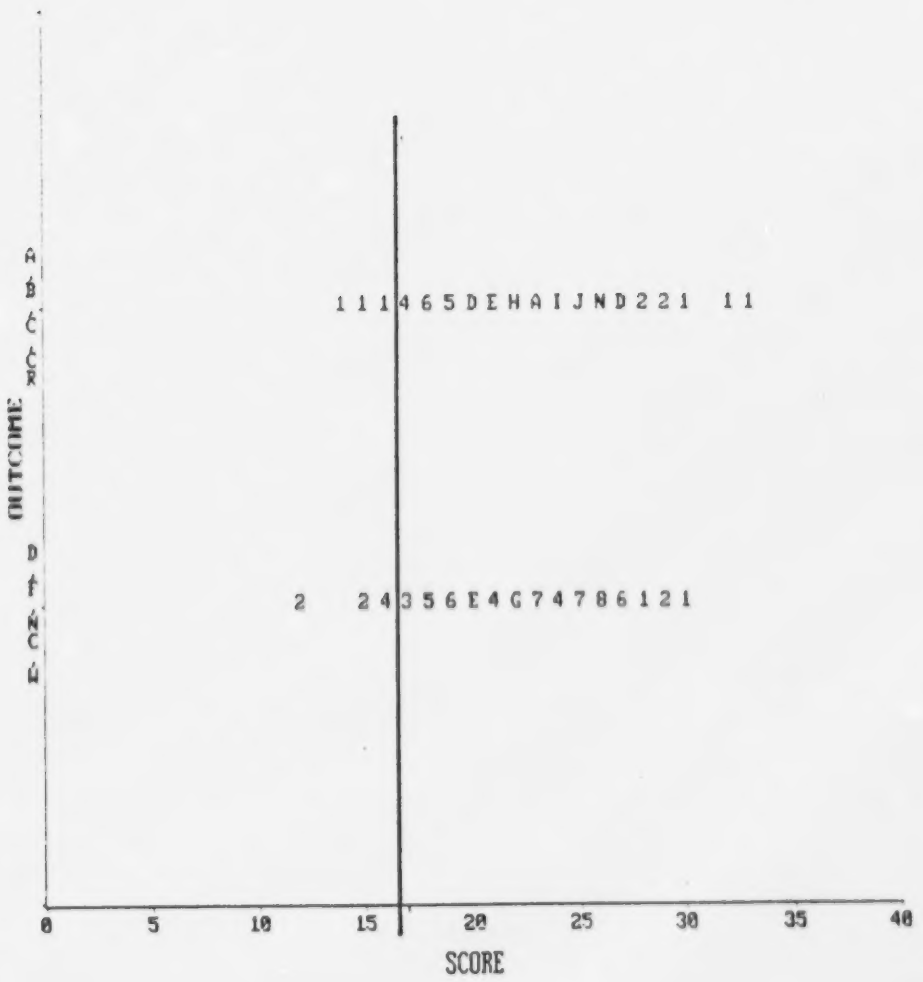
SCATTER DIAGRAM
Data: English 02 - S&F93
Course: ENGL 090
Test: ENGLISH 02: APS WRITING A
Subgroup: TOTAL
N=244, R = 0.20



Trial Cut Score = 17

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Figure 3.
English 101 Success by APS Writing Test

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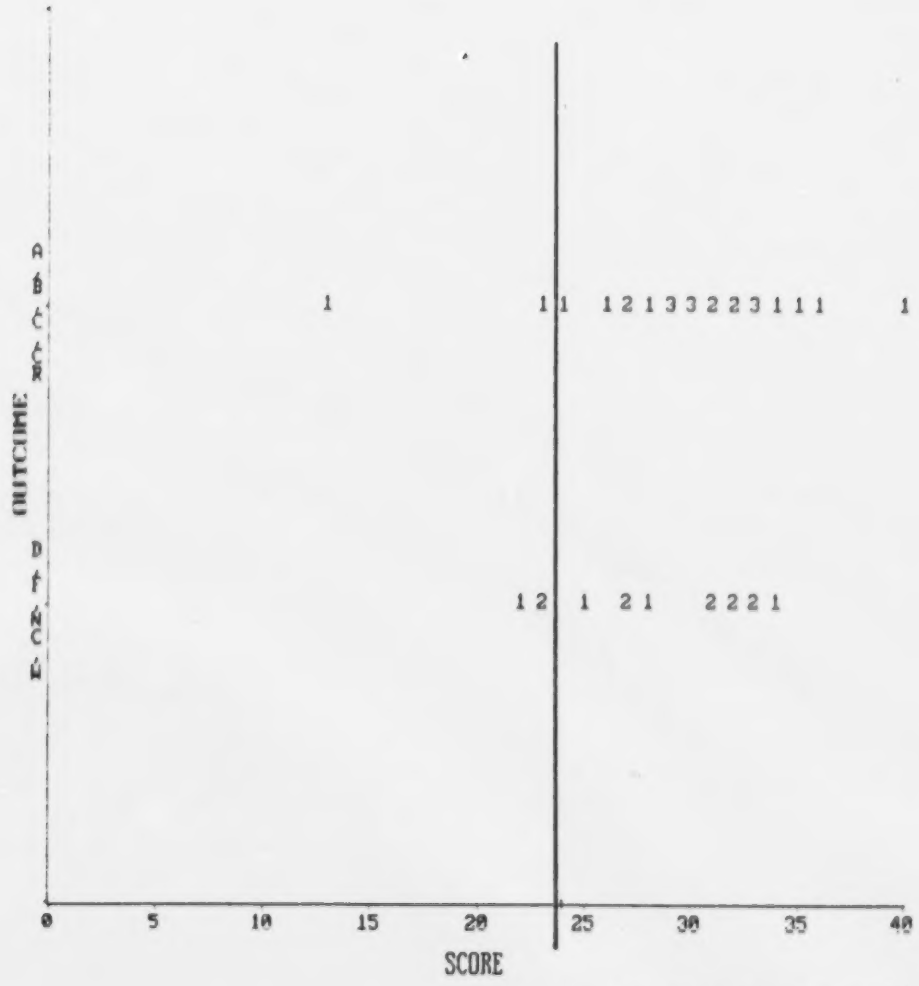
10:52:34 Page 3

SCATTER DIAGRAM
Data: English 02 - S&F93
Course: ENGL 101
Test: ENGLISH 02: APS WRITING A
Subgroup: TOTAL
N=38, R = 0.12



Trial Cut Score = 24

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The scatterplots were partitioned using a variety of possible cut scores. The partitions produced placement classification tables for each trial cut score. The table partitions the data from the scatterplot into four quadrants. The upper right and lower left quadrants represent correct placements. The other two quadrants represent placement errors.

The analysis showed that there were more than one set of cut scores for each course that were optimum in placement accuracy. The recommended cut scores shown in Table 1 were set in the lower part of the optimum range for each course.

Table 1.
Recommended APS Writing Test Cut Scores by Course

Test	Score Range	Recommended Placement	% of Study Sample in Score Range	N
Writing	0 - 12	English 011	5.0%	17
	13 - 16	English 035	10.4%	35
	17 - 23	English 090	41.3%	139
	24 - 40	English 101	43.4%	146

Current APS Writing Test Cut Scores By Course

Test	Score Range	Recommended Placement	% of Study Sample in Score Range	N
Writing	0 - 10	English 011	1.2%	4
	11 - 15	English 035	12.4%	42
	16 - 27	English 090	74.8%	252
	28 - 40	English 101	11.6%	39

Placement Accuracy. Tables 2 through 4 are placement classification tables that show the relationships between admission status (that would have resulted from use of the recommended placement rules) and actual student performance observed in the course. For this analysis, students were considered eligible for the course they selected if their score exceeded the cut score, even if that score would have qualified them for admission to a higher level course. Correct classifications are represented in the upper right and lower-left cells of the table, the sum of these cells represents the total of correct placement. The percentage of correct classifications is shown as a footnote to each table. In addition, the footnotes show the net gain in correct placements that would result from use of the recommended cut score and the percentage of students eligible (selection ratio) under this placement rule.

Table 2.
Percentage of Students by English 035 Success and Admission Status

CLASSIFICATION TABLES FOR OPTIMAL CUT SCORES
Database: English 02 - S&F93 (Filter: NONE)
Course: ENGL 035
Test: ENGLISH 02: APS WRITING A
Subgroup: TOTAL (N = 45)

	NOT ELIG < 13	ELIGIBLE >= 13	
SUCCESS A,B,C,CR	3 6.7% r 14.3% c 27.3%	18 40.0% r 85.7% c 52.9%	21 46.7% r 100.0%
NOT SUCC D,F,NC,W	8 17.8% r 33.3% c 72.7%	16 35.6% r 66.7% c 47.1%	24 53.3% r 100.0%
	11 24.4% c 100.0%	34 75.6% c 100.0%	45 100.0%

Correct Placements:	57.8%
Base Rate(non-succ):	53.3%
Gain in Accuracy:	4.4%
Selection Ratio:	75.6%
Diff in Succ Ratio:	25.7%

Table 3.
Percentage of Students by English 090 Success and Admission Status

CLASSIFICATION TABLES FOR OPTIMAL CUT SCORES
Database: English 02 - S&F93 (Filter: NONE)
Course: ENGL 090
Test: ENGLISH 02: APS WRITING A
Subgroup: TOTAL (N = 244)

	NOT ELIG < 17	ELIGIBLE >= 17	
SUCCESS A,B,C,CR	3 1.2% r 2.0% c 27.3%	149 61.1% r 98.0% c 63.9%	152 62.3% r 100.0%
NOT SUCC D,F,NC,W	8 3.3% r 8.7% c 72.7%	84 34.4% r 91.3% c 36.1%	92 37.7% r 100.0%
	11 4.5% c 100.0%	233 95.5% c 100.0%	244 100.0%

Correct Placements:	64.3%
Base Rate (success):	62.3%
Gain in Accuracy:	2.0%
Selection Ratio:	95.5%
Diff in Succ Ratio:	36.7%

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Table 4.
Percentage of Students by English 101 Success and Admission Status

CLASSIFICATION TABLES FOR OPTIMAL CUT SCORES
Database: English 02 - S&F93 (Filter: NONE)
Course: ENGL 101
Test: ENGLISH 02: APS WRITING A
Subgroup: TOTAL (N = 38)

	NOT ELIG < 24	ELIGIBLE >= 24		
SUCCESS A,B,C,CR	2 5.3% r 8.3% c 40.0%	22 57.9% r 91.7% c 66.7%	24 63.2% r 100.0%	Correct Placements: 65.8% Base Rate (success): 63.2% Gain in Accuracy: 2.6%
NOT SUCC D,F,NC,W	3 7.9% r 21.4% c 60.0%	11 28.9% r 78.6% c 33.3%	14 36.8% r 100.0%	Selection Ratio: 86.8% Diff in Succ Ratio: 26.7%
	5 13.2% c 100.0%	33 86.8% c 100.0%	38 100.0%	

The following line graphs provide a visual depiction of three of the major factors considered when selecting the appropriate cut scores: (1) percentage of correct placements; (2) percentage of false positives - or those who were eligible but who received an unsuccessful final grade; and (3) percentage of false negatives - or those who were ineligible but who received a successful final grade. One common error in selecting cut scores is to only look at the the percentage of correct placements. By doing so, it encourages cut scores that are too high. Figures 4 through 6 show the recommended cut scores for English 035, 090 and 101.

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Figure 4.
English 035 Recommended Cut Score of 13

College of the Canyons

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CLASSIFICATION TABLES FOR OPTIMAL CUT SCORES
Data: English 02 - SAI93
Course: ENGL 035
Test: ENGLISH 02: APS WRITING A
Subgroup: TOTAL
N=45

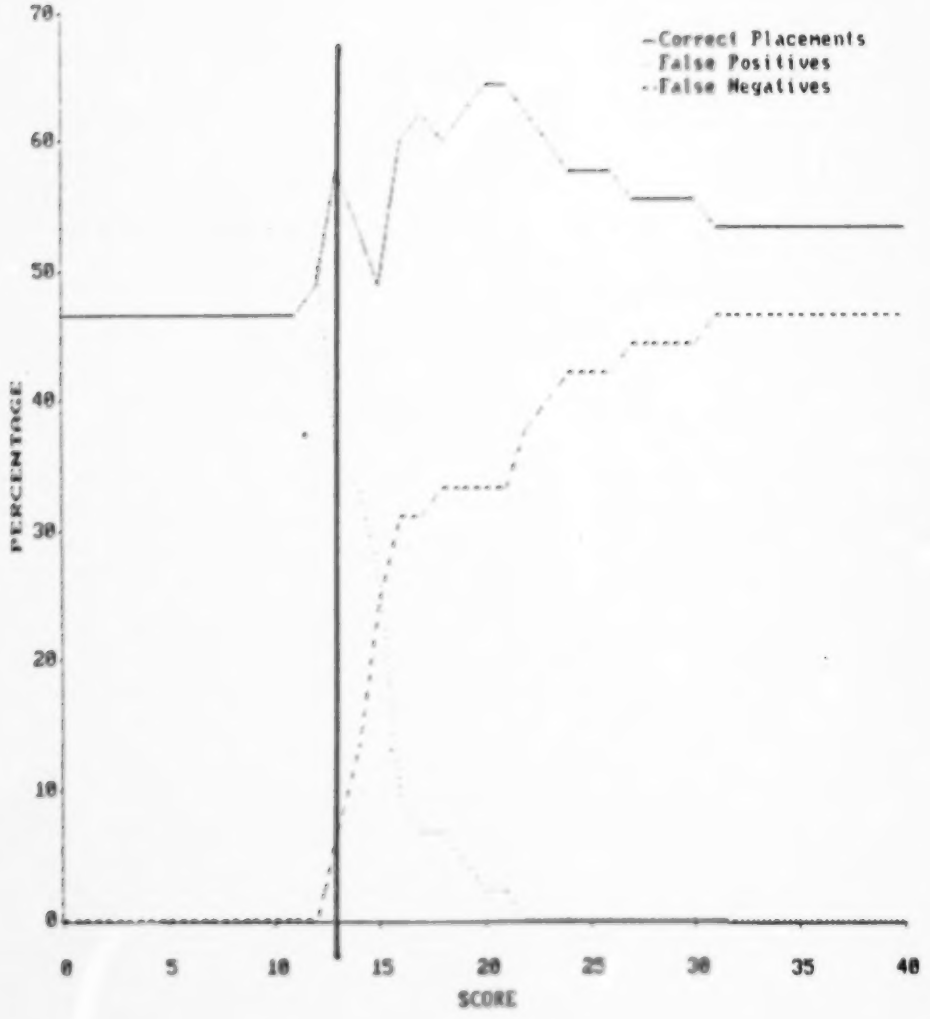

Figure 5.
English 090 Recommended Cut Score of 17

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CLASSIFICATION TABLES FOR OPTIMAL CUT SCORES
Data: English 02 - SAF93
Course: ENGL 090
Test: ENGLISH 02: APS WRITING A
Subgroup: TOTAL
N=244

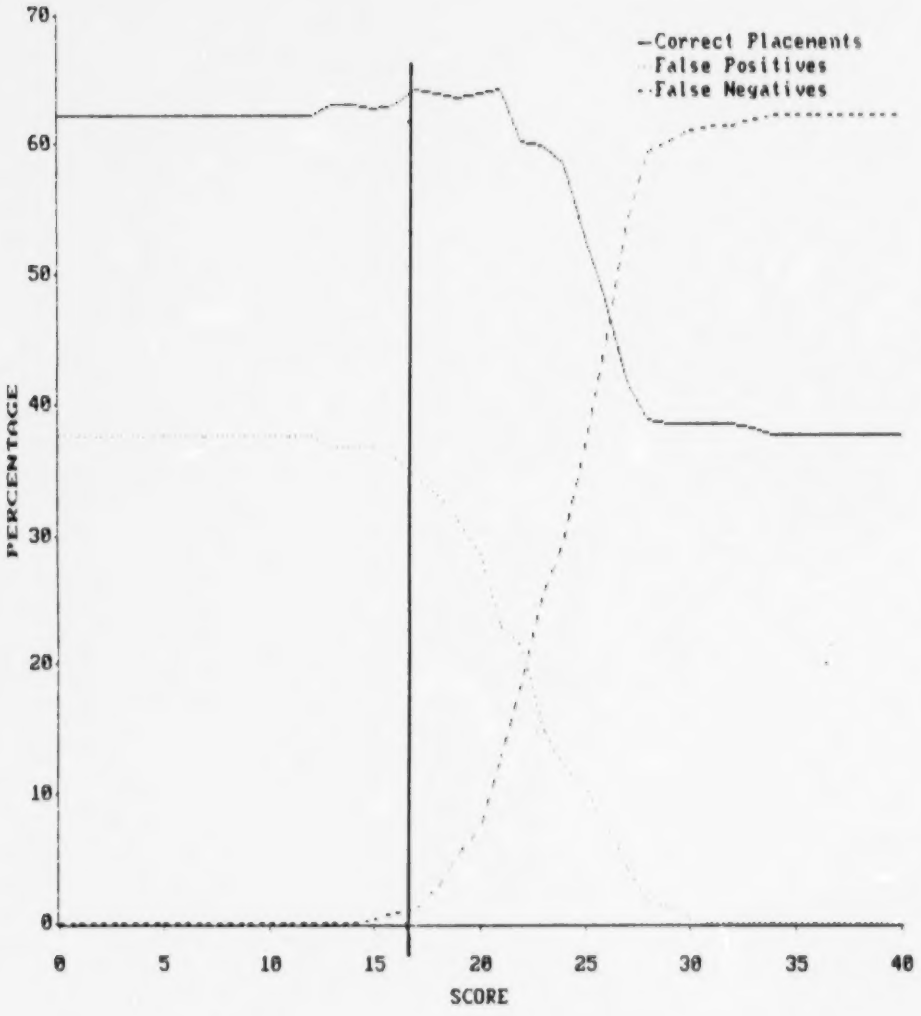

Figure 6.
English 101 Recommended Cut Score of 24

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CLASSIFICATION TABLES FOR OPTIMAL CUT SCORES
Data: English 02 - S&F93
Course: ENGL 101
Test: ENGLISH 02: APS WRITING A
Subgroup: TOTAL
N=38

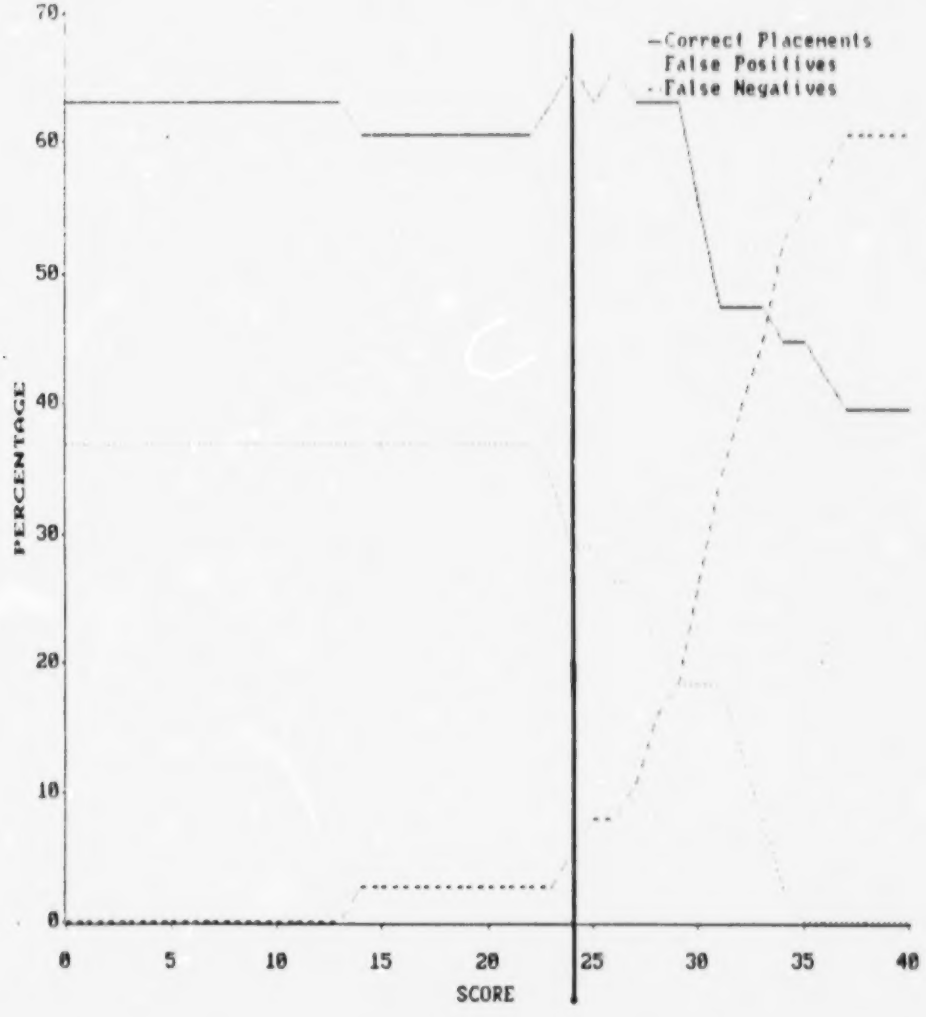

Table 5 provides supplemental information in support of the relationship between test scores and grades. Specifically, the mean test scores for key criterion (grade) defined groups -- for students earning an A or B grade, a C or Credit grade, a grade of D, F or No Credit, and those receiving Ws -- are presented. English 011, 035 and 090 are all graded on a Credit/No Credit grading system, so grades of A and B were not present. The mean test scores for the successful students is clearly greater than the mean values for students who earned unsuccessful grades of D, F or No Credit. While the pattern is not a perfect linear relationship, these data are consistent with the overall linear relationships between test scores and course grades, and also support the reasonableness of the recommended cut score levels.

Table 5.

Mean Score for Key Grade-Based Criterion Groups, By Course

Test/Course	Final Grade Earned A/B	C/CR	D/F/NC	W
APS Writing Test				
English 011	*	*	*	*
English 035	*	16.67	13.40	15.89
English 090	*	23.28	21.23	22.91
English 101	32.00	27.58	30.17	27.50

* N is 5 or less.

Since the study sample represents only a portion of the students who actually took the APS Writing Test in Spring and Fall 1993, we questioned what proportion of the total group (N = 1498) would have fallen into each of the cut score ranges. Table 6 provides the breakdown.

Table 6.
Recommended APS Writing Test Cut Score by Course, Spring and Fall 1993

Test	Score Range	Recommended Placement	% of Total Tested	N
Writing	0 - 12	English 011	4.2%	63
	13 - 16	English 035	8.8%	131
	17 - 23	English 090	30.9%	464
	24 - 40	English 101	56.1%	840

A smaller percentage of the total group of test-takers fell into each of the three lower cut score ranges than was true of the study sample. Using the recommended cut scores of 24 - 40, the majority (56.1%) of all tested students would have been recommended for placement in English 101. This compares to only 26.6% of the total group - had the current cut scores been used (28 - 40).

DISCUSSION

The findings of this study validate the use of the APS Writing Test to support placement decisions for students entering English 035, 090 and 101. Use of the test together with the proposed placement rules could increase the rate of correct placement over the base rate by 4.4% for English

035, by 2.0% for English 090 and 2.6% for English 101.

A thorough review of these findings by all involved faculty and Student Services personnel is encouraged.

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